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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,371	03/04/2002	Dawei Huang	HUANG 2-1 (58655)	5175

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EXAMINER	
TORRES, JOSEPH D	
ART UNIT	**PAPER NUMBER**
2133	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/090,371	HUANG ET AL.	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 March 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because the handwriting in the drawings is difficult to read. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 3, 12 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 3, 12 and 19 recite, "the inserted zeros comprise an equivalent time varying convolutional code". Nowhere in the Application does the Applicant teach "inserted zeros comprise an equivalent time varying convolutional code". Zeros are zeros or a zero code not a convolutional code.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato; Osamu et al. (US 5436918 A, hereafter referred to as Kato).

35 U.S.C. 102(b) rejection of claims 1, 4 and 10.

Kato teaches a data receiving circuit for receiving a digital input data sequence and periodically inserting known symbols into the digital input data sequence and forming an expanded digital input data sequence (Fixed Bit Inserting Section 3 in Figure 4A of Kato is a data receiving circuit for receiving a digital input data sequence and periodically inserting known symbols into the digital input data sequence and forming an expanded digital input data sequence); and an encoder operatively connected to said data receiving circuit for trellis encoding the expanded digital input data sequence to produce a channel coded data stream such that the number of connections between trellis nodes in a trellis are reduced (Convolutional Error Correction Encoding Circuit 4 is an encoder operatively connected to said data receiving circuit for trellis encoding the expanded digital input data sequence to produce a channel coded data stream such that the number of connections between trellis nodes in a trellis are reduced: Note: since the inserted bit is known at the decoder in Figure 4B of Kato connections to the nodes for inserted bits in the Trellis of Figure 7 in Kato are known which reduces connections by not having to connect to any of the other nodes for the inserted bit, see Figure 3 in Kato for comparison).

35 U.S.C. 102(b) rejection of claims 2, 3, 11 and 12.

The Abstract in Kato teaches that the inserted bit can be a one or a zero.

35 U.S.C. 102(b) rejection of claims 5 and 13.

Convolutionally coded codewords are inherently in a one-to-one mapping with the distinct paths on a trellis to binary sequences.

35 U.S.C. 102(b) rejection of claims 6 and 14.

Note: the encoder of Figure 4A in Kato is inherently capable of inserting bits into any position of the received data stream. See In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971) and In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

35 U.S.C. 102(b) rejection of claim 7.

Convolutionally coded codewords are inherently operative as a generator matrix having a constraint length k=m-1, wherein m corresponds to the memory length, and the code rate is R=1/l. Note: the encoder of Figure 4A in Kato is inherently capable of inserting bits into any position of the received data stream. See In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971) and In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

35 U.S.C. 102(b) rejection of claims 8, 9, 15 and 16.

Col. 1, lines 25-31 in Kato teach a Maximum Likelihood (ML) decoder comprising a Viterbi decoder.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 17-22 arerejected under 35 U.S.C. 103(a) as being unpatentable over Kato; Osamu et al. (US 5436918 A, hereafter referred to as Kato) in view of Wicker (Stephen B. Wicker, Error Control Systems for Digital Communication and Storage, Prenitce-Hall, Pages 264-273).

35 U.S.C. 103(a) rejection of claim 17.

Kato teaches a data receiving circuit for receiving a digital input data sequence and periodically inserting known symbols into the digital input data sequence and forming an expanded digital input data sequence (Fixed Bit Inserting Section 3 in Figure 4A of Kato is a data receiving circuit for receiving a digital input data sequence and periodically inserting known symbols into the digital input data sequence and forming an expanded

digital input data sequence); and an encoder operatively connected to said data receiving circuit for trellis encoding the expanded digital input data sequence to produce a channel coded data stream such that the number of connections between trellis nodes in a trellis are reduced (Convolutional Error Correction Encoding Circuit 4 is an encoder operatively connected to said data receiving circuit for trellis encoding the expanded digital input data sequence to produce a channel coded data stream such that the number of connections between trellis nodes in a trellis are reduced: Note: since the inserted bit is known at the decoder in Figure 4B of Kato connections to the nodes for inserted bits in the Trellis of Figure 7 in Kato are known which reduces connections by not having to connect to any of the other nodes for the inserted bit, see Figure 3 in Kato for comparison). Note: the encoder of Figure 4A in Kato is inherently capable of inserting bits into any position of the received data stream. See In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971) and In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

However Kato does not explicitly teach the specific use of producing a generator matrix having a constraint length k=m-1, wherein m corresponds to the memory length and the code rate is R=1/l.

Wicker, in an analogous art, teaches producing a generator matrix having a constraint length k=m-1, wherein m corresponds to the memory length and the code rate is R=1/l (See Generator Matrix 11-12 on page 269 of Wicker).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kato with the teachings of Wicker by including use of

producing a generator matrix having a constraint length k=m-1, wherein m corresponds to the memory length and the code rate is R=1/l. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of producing a generator matrix having a constraint length k=m-1, wherein m corresponds to the memory length and the code rate is R=1/l would have provided the opportunity to produce an appropriate convolutional encoder for a given application.

35 U.S.C. 103(a) rejection of claims 18 and 19.

The Abstract in Kato teaches that the inserted bit can be a one or a zero.

35 U.S.C. 103(a) rejection of claim 20.

Convolutionally coded codewords are inherently in a one-to-one mapping with the distinct paths on a trellis to binary sequences.

35 U.S.C. 103(a) rejection of claims 21 and 22.

Col. 1, lines 25-31 in Kato teach a Maximum Likelihood (ML) decoder comprising a Viterbi decoder.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Park; Chang-Soo et al. (US 6397367 B1) teaches bit insertion for

a convolutional encoder. Kim; Jae-Yeol et al. (US 6487693 B1) teaches bit insertion for a convolutional encoder. Li; Jifeng (US 6519732 B1) teaches bit insertion for a convolutional encoder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD
Art Unit 2133